

# Benchmarking for Performance

## California Debt and Investment Advisory Commission

### November 17, 2006

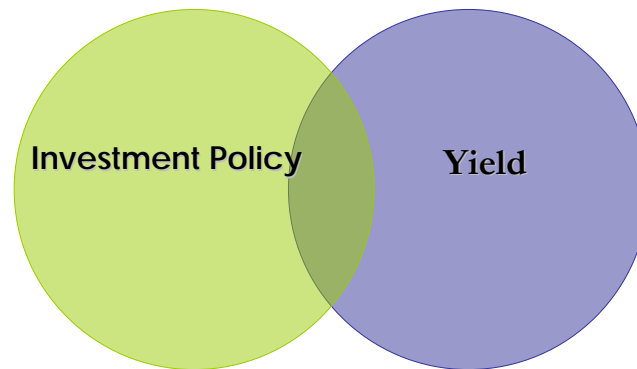


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## Public Fund Cash Management Constructs

Investment Policy	Political and Internal Environment	Risk	Return
<ul style="list-style-type: none"><li>• Safety</li><li>• Preservation of Capital</li><li>• Market Rate of Return</li><li>• Liquidity</li></ul>	<ul style="list-style-type: none"><li>• Board</li><li>• Investment Committee</li><li>• Staff Turnover</li></ul>	<ul style="list-style-type: none"><li>• Default Risk</li><li>• Mark to Market Risk</li><li>• Political Risk</li></ul>	<ul style="list-style-type: none"><li>• Book Yield – Accrual</li><li>• Performance – Mark to Market</li></ul>

## Traditional Portfolio Management Tools



## Cross Construct Phenomena

Decision Making Strategy Tools	Improved Process	Improved Communication	Self-Monitoring
<ul style="list-style-type: none"> <li>• Duration -87% of returns</li> <li>• Asset Allocation</li> <li>• Yield Curve Positioning</li> </ul>	<ul style="list-style-type: none"> <li>• Efficient</li> <li>• Pre-determined strategy</li> <li>• Accountable</li> </ul>	<ul style="list-style-type: none"> <li>• Same Vocabulary</li> <li>• Board, Committee and Staff</li> <li>• Consistent over interest rate cycles</li> </ul>	<ul style="list-style-type: none"> <li>• Understand outcome of decisions</li> <li>• Tracking of decisions</li> <li>• Value added can be measured</li> </ul>

## Additional Portfolio Management Tool



## Additional Portfolio Management Tool



### 1) Incorporates GASB Requirements

GASB 31 – Mark to Market

GASB 40 - Risk

## Additional Portfolio Management Tool

2) Decision Making Strategy:



Investment Alternative Today:

LAIF Pool at 5.25%

or

Two Year Agency at 5.10%

## Additional Portfolio Management Tool



### 3) Improves Comparison Data

#### CDIAC INVESTMENT REVIEW 6/30/05

Yield			
	Avg	Low	High
Under 94M	3.2%	2.8%	4.8%

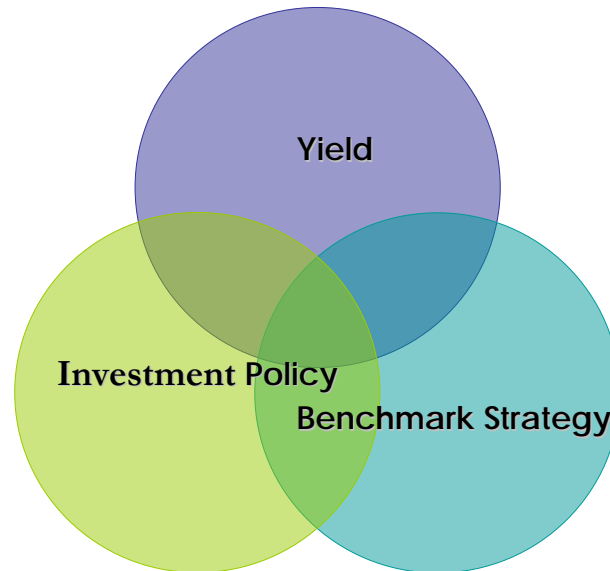
DTM (Days)			
	Avg	Low	High
Under 94MM	405	1	648



## Encompassing Portfolio Management Tools

## Effect:

- Purchase date
- Maturity of Portfolio



## Framework:

Maturity  
Asset Allocation  
Broker Relationships  
Define Goals

## Process:

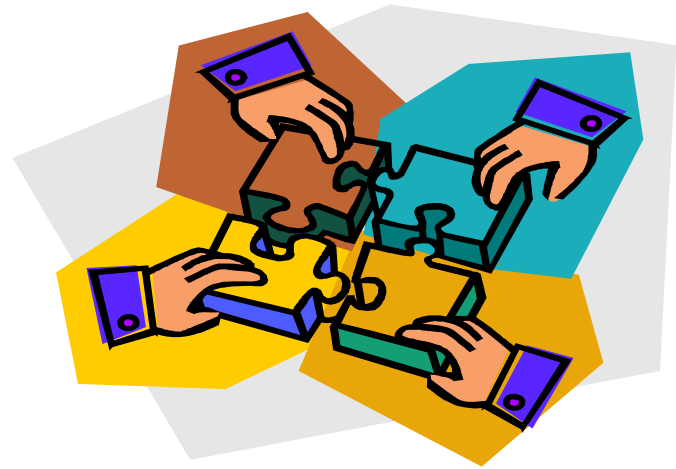
- Control Risk
- Manage Return
- Accountability
- Strategy

# Value of Applying Benchmark

## Individual Issues Held



## Portfolio of Securities with a defined structure



## What is a Benchmark?

- Keeps you focused
- Helps make decisions efficiently and effectively
- Guides you
- Provides clarity of strategy communication to board
- An irreplaceable tool you can't live without
- Other Redeeming Factors:
  - You can use it for forecasting
  - It is commonplace for investment professionals

## Descriptive characteristics of a Benchmark

- Previously determined
- Standard
- To measure
- Compare to improve
- Gauge

## Why do investors use benchmarks?

- Compare Returns:
  - Asset performance relative to the benchmark
- Compare Risk:
  - Investments priced correctly compared to the benchmark
- Accountability
- Improved communication
- Guidelines that provide peace of mind

## Who uses benchmarks?

- Retirement Investments:
  - Compare your investment performance choices to S&P 500
- Money Managers:
  - Compare their managed funds to industry standards
- Public Fund Investors:
  - Compare core operating funds to market standards
    - Core operating funds are not used for daily cash flow (liquidity portion) needs.

## Your challenges when making investments

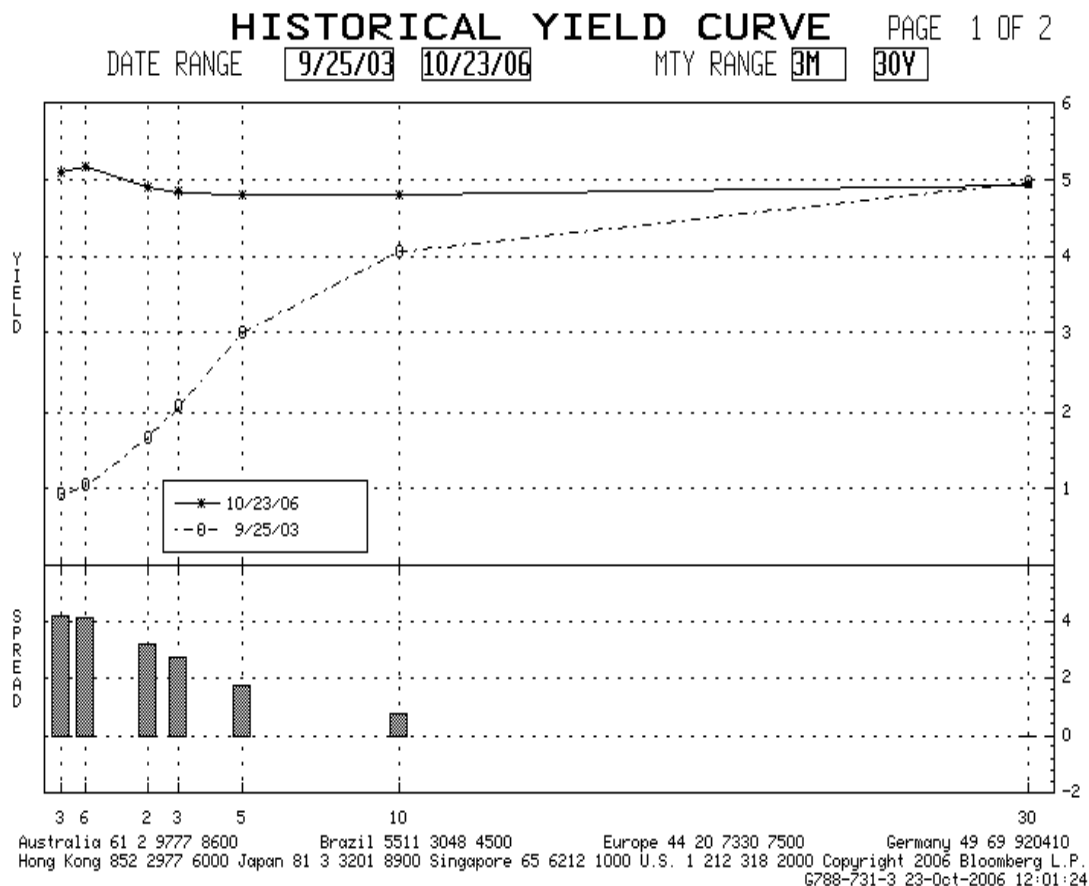
- Do Interest rates change?
- Does your investment strategy change with rates?
- Current portfolio performance relative to the market?
- Budgeting concerns due to changes in rates?
- Portfolio goal:
  - Highest yield or most value over time horizon
- Limited tools to implement strategy

# Historical Interest Rate Review

## The Market is Dynamic

<HELP> for explanation.

P157Msg:JUDY WELKER



Maturity	9/25/03	10/25/06
3 Month	.92%	5.10%
6 Month	1.01%	5.16%
2 Year	1.64%	4.90%
3 Year	2.06%	4.83%
5 Year	3.00%	4.794%



# Historical Averages of Interest Rates

## The Market is Dynamic

### 5 Year Historical Average - Treasury

3 Month - 2.23%  
6 Month - 2.83%  
2 Year - 2.93%  
5 Year - 3.71%

### 10 Year Historical Average -Treasury

3 Month - 3.64%  
6 Month - 3.78%  
2 Year - 4.20%  
5 Year - 4.67%

### Rates as of 10/23/06 - Treasury

3 Month - 5.10%  
6 Month - 5.16%  
2 Year - 4.90%  
5 Year - 4.79%

# Cash management investing terms

Liquidity

Core Fund

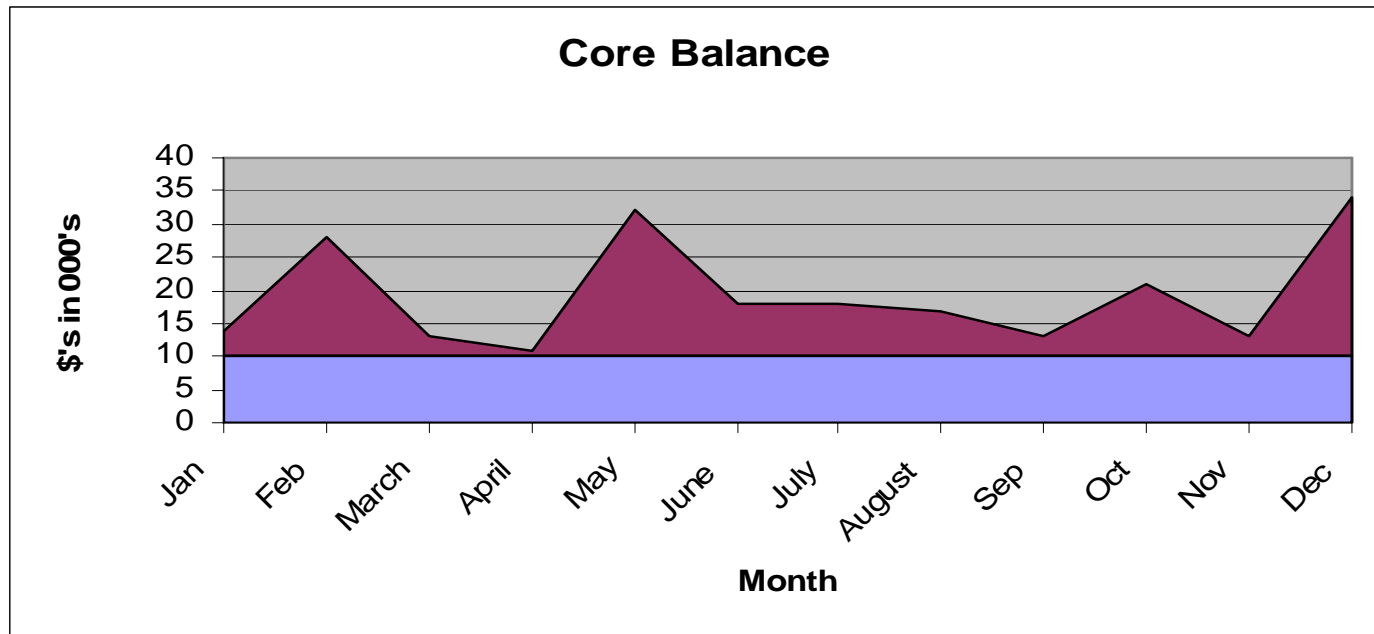
Duration – Measure of risk

## Liquidity

- The amount that remains available to pay the bills.
- Invested in liquid pools or short money market paper
- Can define maturities under 3,6 or 12 months

## Core Funds

- Operating funds = Not for daily liquidity requirements
- Historical Cash Flows
- Utilized to enhance returns



## Duration

- Measure price sensitivity of a bond or portfolio
- Allows investors to articulate price moves

Example:

**Duration = 1.2 years**

**Market Value = 100,000,000**

**Rates move down by 1.5% from 5.5% to 4.%**

*Calculation =  $100,000,000 * 1.2 \text{ (duration)} * .015 \text{ (rate move)} = \$1,800,000.00$*

Portfolio moves from \$100,000,000 to **\$101,800,000.00**

Reverse happens if rates rise value to **\$98,200,000.00**

## SAMPLE PORTFOLIO

## LIQUIDITY COMPONENT OF PORTFOLIO

400MM State Pool or short Term Money Market Issues

## CORE COMPONENT OF PORTFOLIO- 9/30/06

Issue	Acq Date	Acq Yield	% Holding	Duration
20MM FFCB 4 7/18/07	5/5/05	3.858	20%	.77
20MM FHLB 5.125 6/13/08	5/31/06	5.25	20%	1.58
20MM FNMA 5.05 1/12/09-1/07	1/27/06	5.09	20%	1.11
20MM FFCB 4.125 9/26/08	9/13/05	4.571	20%	1.88
20MM FHLB 5.375 9/8/10-9/08	9/6/06	5.375	20%	2.39
100mm		4.83	100%	1.54 YEARS



## Duration Characteristics of Total Portfolio

### TOTAL PORTFOLIO

400MM Liquidity	80%	.1
100MM Core Fund	<u>20%</u>	<u>1.54</u>
Total Fund – 500MM	100	.38

## Evaluating an Investment Strategy for Core Funds

- The investment program exists in a dynamic environment
- There are risk and return trade off's
- Cash has opportunity cost
- Portfolio characteristics are dynamic



# What Strategy do You Implement Today?

- Buy and Hold:
- Passive Portfolio Management:
  - Do the same thing, always
- Active Management:
  - Position portfolio based on expectations
- Benchmark Strategy:
  - Strategy that is reactive to rates
  - Strategy that controls risk (duration)
  - Works for buy and hold accounts

## Your Own Strategy

- Dependent on specific objectives of your organization
- Expertise of internal staff
- External resources

## Benchmark Strategy Objectives

- Manages return expectations
- Controls risk exposure in the portfolio
- Provides guidance for investment decisions

## Benchmarks for Public Entities

- Two types of reporting benchmarks:
  - Book Yield or Interest Accruals: (Static)
    - Acquisition yield of portfolio securities
    - Often book yield is compared to pool rates
  - Total Return Reporting: (Dynamic)
    - AKA: Fair Market Value or Market Value Reporting
    - Incorporates market value change w/coupon cash flow
    - Incorporates both risk and return
  - Public entities are incorporating both

## What are Market Standards Benchmarks for Operating Funds?

- State or Local Investment Pools – Book Yield Comparison
- Merrill/Lehman/Soly Treasury Indexes – Market Comparisons
  - Merrill Indices on Bloomberg IND <GO>
  - Merrill 0 – 1 year Symbol: G0QA
  - Merrill 0 – 3 year Symbol: G1QA
  - Merrill 1 - 3 year Symbol: G102
  - Merrill 0 – 5 year Symbol: GVQA
  - Merrill 1 – 5 year Symbol: GVQ0

CUSTOM COMBINATON

# Strategy Utilizing Benchmarks

## STEPS:

- Evaluate return expectations
- Determine acceptable risk tolerance
- Establish appropriate benchmark
- Establish duration targets
- Determine guidelines
- Monitor and report performance
- Rebalance the portfolio

## Benchmark Objective- Return

- Manages the returns to expectations:
  - Performance will be close to the benchmark return
  - Variance of return will be due to variance in duration
  - Manages the balance between core and liquidity

## Components of Performance

- Interest Earnings
  - Coupon Payment & Accrued Interest
- Price Change
  - Increase or Decrease in value of the portfolio
    - Both components are impacted by interest rate Changes and should be incorporated into your strategy



## Benchmark Total Return Price + Interest Earnings

	2001	2002	2003	2004	2005
ML 0-1 Year Treasury (Pool)	5.31	2.21	1.27	1.16	2.84
ML 0-3 Year Treasury	6.98	4.45	1.66	.977	2.10
ML 0-5 Year Treasury	7.31	5.94	1.82	1.23	1.79
	Duration	5 year Average 12/31/00-12/31/05		2006 YTD* 12/31/05-9/30/06	
ML 0-1 Year Treasury (Pool)	.58 yrs	2.55		4.60	
ML 0-3 Year Treasury	1.2 yrs	3.21		4.28	
ML 0-5 Year Treasury	1.85 yrs	3.59		4.15	

Source: [www.davidsonfim.com](http://www.davidsonfim.com) --Bloomberg IND

\* 2006 annualized Return

# Benchmark Accrual Comparison

## 12/31/00-12/31/05

	Duration	Total Return	Book Yield
ML 0-1 Year Treasury (Pool)	.58 yrs	2.53%	
ML 0-1 Year Monthly Roll	.58yrs		2.30%
ML 0-3 Year Treasury	1.2 yrs	3.21%	
ML 0-3 Year Treasury Roll	1.2 yrs		2.58%
ML 0-5 year Treasury	1.85 yrs	3.59%	
ML 0-5 Year Treasury Roll	1.85 yrs		2.79%

\*Roll = Average month YTM of portfolio structure

Source: Bloomberg IND

Source: [www.davidsonFIM.com](http://www.davidsonFIM.com)

# Benchmark Accrual Comparison

## 12/31/95-12/31/05

	Duration	Total Return	Book Yield
ML 0-1 Year Treasury (Pool)	.58 yrs	4.07%	
ML 0-1 Year Monthly Roll	.58yrs		3.90%
ML 0-3 Year Treasury	1.2 yrs	4.49%	
ML 0-3 Year Treasury Roll	1.2 yrs		4.11%
ML 0-5 year Treasury	1.85 yrs	4.72%	
ML 0-5 Year Treasury Roll	1.85 yrs		4.25%

\*Roll = Average month YTM of portfolio structure

Annualized Returns

Source: Bloomberg IND

Source: [www.davidsonFIM.com](http://www.davidsonFIM.com)

## Ending Value Comparisons of Various Benchmarks 12/31/00-12/31/05

Ending Value and Return:

\$100,000,000.00 Invested Over the Last 5 Years

	Value	Return %
ML 0-1 Year Treasury Index	\$113,424,000	13.424%
ML 0-3 Year Treasury Index	\$117,112,000	17.112%
ML 0-5 Year Treasury Index	\$119,294,000	19.294%

## Ending Value Comparisons of Various Benchmarks

12/31/95-12/31/05

Ending Value and Return:

\$100,000,000.00 Invested Over the Last 10 Years

	Value	Raw Return/Annualized %
ML 0-1 Year Treasury Index	\$149,071,000	49.071%/4.07%
ML 0-3 Year Treasury Index	\$155,216,000	55.216%/4.49%
ML 0-5 Year Treasury Index	\$158,786,000	58.786%/4.72%

## Benchmark Objectives - Risk

- Controls risk exposure in the portfolio
  - Portfolio structure properly reflects risk tolerance of entity
  - Target ranges in duration ensure application of risk management

## Determine Acceptable Risk Tolerance

%Price Change given Yield shifts on \$100MM Portfolio

<i>Index</i>	<i>Duration</i>	100bp+/-		200bp+/-	
		<i>%P</i>	<i>Value</i>	<i>%P</i>	<i>Value</i>
Merrill 0-1 Year	.58	.58%	\$580,000	1%	\$1,160M
Merrill 0-3 Year	1.2	1.2%	\$1,200M	2.4%	\$2,400M
Merrill 0-5 Year	1.85	1.85%	\$1,850M	3.7%	\$3,700M

\* Rates move on average 200bp within 1 year time period

## Establish Appropriate Benchmark

### Primary Criteria:

Risk Expectations

Return Expectations

### Additional Criteria:

1. Allowable types of securities
2. Time horizon of portfolio- Core Fund
3. Maturity constraints of portfolio- Investment policy



# Establishing Duration Targets

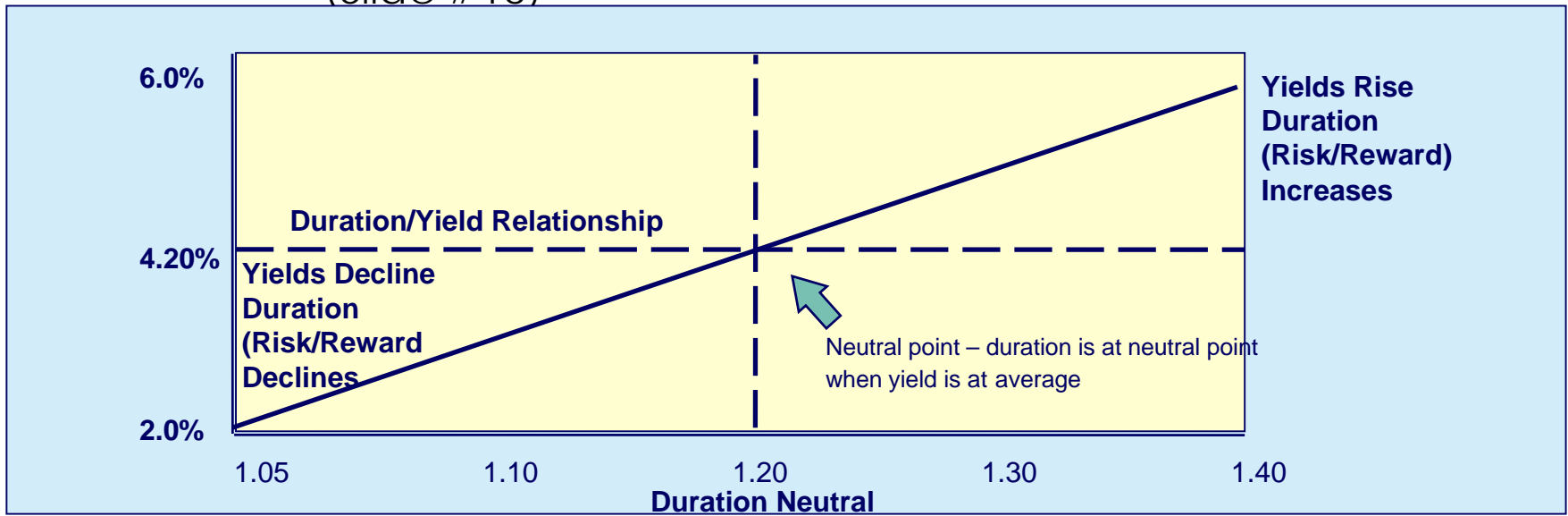
Establish Neutral Position

Neutral – 1.2 years

Benchmark 0-3 year Index

4.2% = 10 year Average rate on 2 year note

(Slide #16)



## Core Fund Guidelines (Sample Portfolio)

Target size of core balance

\$50MM → \$75MM

Benchmark to control risk and measure return

Treasury 0-3 year  
Treasury Index

Code: GVQA

Duration: Approximately 1.2 years

Asset allocation: Within policy

Maturity structure: Within policy

## Core Fund Guidelines (Sample Portfolio)

Duration range of portfolio relative to +/- 25% or duration benchmark	Minimum .9years  Maximum 1.5 years
Asset Allocation Constraints	100% Maximum treasury  90% Maximum agency  50% Maximum callable securities
Strategy and timeline	The portfolio will be adjusted periodically to reflect the above guidelines.

## Duration Target

- **Target Duration Range**
  - Based on the Treasury 0-3 Year Index Duration = 1.2 years
  - Target Range +/- 25% Min-.9 yr Max -1.5 yr

### 2 year Yield

2.0 - 4.0%

4.0 – 5.0%

5.0- 6.0%

### Duration Target

.9-1.1

1.1 - 1.3

1.3 – 1.5

## Monitor Portfolio Compared to Benchmark

### Returns

#### Portfolio

#### Benchmark

1/31/06	.317%	.166%
<b>2/28/06</b>	<b>.207%</b>	<b>.081%</b>
3/31/06	.249%	.137%
4/30/06	.304%	.313%
5/31/06	.235%	.152%
6/30/06	.254%	.183%
7/31/06	.703%	.733%
<b>8/31/06</b>	<b>.623%</b>	<b>.701%</b>
9/30/06	.530%	.520%

### Risk

#### Portfolio

#### Benchmark

1.32	1.68
<b>1.32</b>	<b>1.75</b>
1.27	1.72
1.23	1.68
1.27	1.76
1.22	1.74
1.21	1.72
<b>1.36</b>	<b>1.62</b>
1.40	1.76

## Monitor Portfolio Compared to Benchmark

### Returns YTD - 9/30/06

### Since Inception - 12/97

Portfolio

Benchmark

Portfolio

Benchmark

Raw Return

3.472%

3.024%

55.019%

46.895%

Annualized

4.669%

4.063%

5.136%

4.491%

## Conditions for Rebalancing

- Large change in interest rates
- Large change in asset class valuations
- Time has shorten duration below guideline
- The yield curve has made a large shift

### OBJECTIVE OF REBALANCING

To rebalance duration and asset weighting back to guideline levels.

## Custom Benchmark Created

### Custom Benchmark

20% Treasury 0-5 Year

60% Agency Bullet 1-5 Year

20% Corporate MTN 1-3 A+

Target 30% Callable Agency Exposure

**Duration 2.26 Years**



## Rebalance Portfolio - Duration

Monitor variations of the portfolio to the benchmark

	Duration
Portfolio	2.3
Index	2.6
Difference	-.2 years

## Rebalance Portfolio – Asset Class

Monitor variations of the portfolio to the benchmark

### Portfolio

10 % Treasury  
70% Agency  
20% Corporate MTN

### Of Agency

20% Callable Agency

### Customized - Benchmark

20% Treasury 0-5 Year  
60% Agency Bullet 1-5 Year  
20% Corporate A+ 1-3

### Guideline

30% Callable Agency

## Rebalance Portfolio – Decision Process

Scenario:

Yields are above historical average

Want to move portfolio to a neutral position

\$100,000,000 portfolio with \$10,000,000 (10%) in cash

**Current duration 2.3 years**

**Target duration 2.6 years**

Question #1: What maturity do you buy?

## Answer – What If Scenario duration

### Portfolio Extension Target .3 years

10% of Portfolio needs to add .3 years

$$10\% * 3.0 \text{ years} = .3 \text{ years}$$

Buy a three year with a 3 year duration

# What do you buy?

## Evaluate Asset Classes

Underweighted      - Treasury

Overweighted      - Agency

Neutral              - Corporates

Underweighted      - Agency Callable

**Recommendation: Add to callable cushion callable paper.**

## Benefits of a Benchmark Strategy

- Clear sense of direction
- Focus in overall portfolio versus yield
- Accountability to decision making process
- Balances risk and return
- Communication, Communication, Communication
- Confidence and peace of mind

## How to implement?

- Evaluate Internal System and Expertise
- Cost/Benefit Analysis of Outsourcing - Advisors
- Evaluate Value of Improved Process



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Fixed Income Management  
REGISTERED INVESTMENT ADVISER

THANK YOU!





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# Addendum - Various Benchmarks

# SYMBOLS OF INDEX

- G0Q1- Treasury 0-3 Month bills
- G0QA-Treasruy 0-1 Year
- G1QA- Treasury 0-3 Year
- GVQA- Treasury 0-5 Year
- G102 – Treasury 1-3 Year
- GVQ0- Treasury 1-5 Year
- G502 - Treasury 1-10 Year
- G1P0- All Agency 1-3 Year
- G1PB – Agency Bullet 1-3 Year
- G1PC – Agency Callable 1-3 Year
- GVP0 – All Agency 1-5 Year
- GVPB – Agency Bullet 1-5 Year
- GVPC – Agency Callable 1-5 Year
- G50B – Agency Bullet 1-10 Year
- CY31 – 1-3 Year A Rated Corporate
- CY3V– 1-5 Year A Rated Corporate